

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,574	12/04/2003	Thomas G. Anderson	010-03-002	2289
7590	09/09/2004			EXAMINER BASOM, BLAINE T
V. Gerald Gafe, esq. P.O. Box 2689 Corrales, NM 87048			ART UNIT 2173	PAPER NUMBER

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/729,574	ANDERSON, THOMAS G. <i>TS</i>
	Examiner Blaine Basom	Art Unit 2173

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-33 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 04 December 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Claim Objections

Claims 1, 14, and 33 are objected to because of the following informalities: Each of these claims recites an “input device” and a “haptic input device” in reference to the same entity. Such inconsistent terminology may be confusing. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The specification describes a force being applied to an input device depending upon a position of a corresponding object displayed in an application, and describes a force being applied to the input device depending upon an interaction of the object with the application (for example, see page 6, line 26 – page 7, line 11 of the specification). Additionally, the specification describes a force being applied to the input device in response to a component of input device motion not along a device fundamental path (for example, see page 5, line 19 – page 6, line 25 of the specification). The specification, however, does not explicitly disclose that the magnitude of the force responsive to input device motion not along the device fundamental path

is dependent upon the position of the corresponding object along an object fundamental path, as is expressed in claim 21, or that the magnitude of the force responsive to input device motion not along the device fundamental path is dependent on interaction of the object with the application, as is expressed in claim 22.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, there is no antecedent basis for “the object,” which is recited in part “e” of the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 11-14, 19-30, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,219,032, which is attributed to Rosenberg et al. (and hereafter referred to as “Rosenberg”). In general, Rosenberg presents a human/computer interface device in conjunction with a graphical user interface, whereby the interface device is used to affect the motion of a

cursor, and other objects, which are displayed in the graphical user interface. Force feedback is provided to the interface device in order to inform the user of graphical objects encountered by the cursor (see column 2, line 53 – column 3, line 6). Consequently, Rosenberg is considered to teach a method, implemented within a human-computer interface, for allowing a user of a haptic input device to affect the motion of an object in a computer application.

Specifically regarding claim 1, Rosenberg describes a particular type of force feedback applied to the interface device, namely a “groove” force. According to Rosenberg, this groove force provides a detent sensation along a line – to make the interface device feel like it is captured in a groove (see column 38, line 38 – column 39, line 9). While the interface device moves along this groove, no force is applied to the device. However, if the interface device attempts to move out of the groove, a force is applied resisting the device’s movement out of the groove (see column 38, line 38 – column 9, line 39). Rosenberg discloses that a groove force can be applied to a cursor, such that when the cursor is moved into a groove, resistive forces are applied to resist movement out of the groove, but freely allow movement along the length of the groove (see column 57, line 30 – column 58, line 8). This groove force is considered applicable to other user interface objects, as well as a cursor. For example, a groove force may also be applied to a scroll bar or slider “thumb” such that the user is freely able to drag the thumb along the length of the scroll bar, but movement out of the scroll bar is resisted (see column 59, line 49 – column 50, line 39). Consequently, a groove is considered an “object fundamental path,” like that of the claimed invention, as it represents a path of motion of an object in a computer application. Since the position of the interface device corresponds to the position of the object (see column 2, line 67 – column 3, line 7), Rosenberg is also considered to teach establishing a

device fundamental path, representing a path of the interface device, and corresponding to the groove. The object, such as a cursor or scroll bar thumb, is moved along the groove in response to a component of input device motion along the device fundamental path, and a resistive force is applied to the interface device in response to a component of input device motion not along the device fundamental path.

As per claim 2, Rosenberg discloses that a force is applied to the interface device resisting motion of the interface device not along the device fundamental path (for example, see column 57, lines 30-60).

As per claim 3, Rosenberg discloses that additional forces may be applied to the interface device in response to interaction of the object, i.e. cursor, with an application (for example, see column 44, line 65 – column 45, line 21).

In reference to claim 3, Rosenberg teaches applying forces to the interface device corresponding to the motion of the object in an application, wherein the forces provide a perception of momentum and inertia of the input device corresponding to the momentum and inertia of the object. For example, Rosenberg discloses that the above-described thumb may have a simulated mass, such that the user feels the inertia of the thumb when dragging it with a cursor (see column 59, line 49 – column 60, line 29).

Concerning claims 5 and 6, Rosenberg teaches that an application may comprise a plurality of states, and discloses that the above-described object fundamental path, i.e. groove, may be dependent on the state of the application. For example, Rosenberg discloses that if a user selects a button associated with a groove force, the groove force may be turned off (for example, see column 57, line 61 – column 58, line 8). The application thus comprises a plurality of states,

defined by whether or not this button has been selected, whereby the existence of the groove is dependent on these states. Since as described above, the device fundamental path corresponds to the object fundamental path, the device fundamental path is also considered to be dependent on the state of the application.

In regard to claim 7, Rosenberg teaches that a cursor may interact with an application, wherein the interaction of the cursor with the application is dependent on the speed of the cursor (for example, see column 60, lines 30-62). It is therefore understood that a cursor may interact with the application in such a way, particularly as the cursor moves along a groove.

Referring to claim 8, Rosenberg teaches displaying a visual representation of a cursor, i.e. object, to the user, particularly within a graphical user interface (for example, see column 2, line 60 – column 3, line 11).

With respect to claim 11, the cursor of Rosenberg is considered to comprise two representations: a visual representation that is used in a display to provide visual feedback to the user (for example, see column 2, line 60 – column 3, line 3), and an interaction representation that is used with the interface device to provide force feedback to the user (for example, see column 60, lines 30-62).

Concerning claim 12, Rosenberg describes a groove, such that if an interface device attempts to move out of a device fundamental path corresponding to the groove, a force is applied resisting the device's movement, as is described above. This force has a first magnitude for a first position of the interface device a first distance from the device fundamental path, and a second, larger magnitude for a second position of the interface device a second, larger distance

from the device fundamental path (see figure 15, in addition to its description in column 38, line 38 – column 39, line 9).

Regarding claim 13, Rosenberg teaches applying a “capture” or “barrier” force along a device fundamental path corresponding to a groove, wherein the force apposes motion of an interface device beyond an end of the device fundamental path (for example, see figure 21, and its corresponding description in column 59, line 65 – column 60, line 8).

As per claim 14, Rosenberg teaches applying an “attractive external” force to an interface device to urge the device to a starting region of a range of motion of the interface device. For example, such a force may be applied to urge the interface device onto a thumb of a scroll bar (see column 59, lines 49-61).

Regarding claims 19 and 20, Rosenberg describes a groove, such that if an interface device attempts to move out of a device fundamental path corresponding to the groove, a force is applied resisting the device’s movement, as is described above. In other words, Rosenberg teaches that the force resists motion of the interface device off the device fundamental path along a first dimension. Additionally, Rosenberg teaches that a characteristic of an object in the application may be responsive to motion of the interface device off the device fundamental path along a second dimension, different from the first dimension. For example, a “command gesture” may be applied to the object in response to movement of the interface device along this second dimension (see column 45, line 61 – column 46, line 19).

Regarding claims 21 and 22, Rosenberg describes a groove, such that if an interface device attempts to move out of a device fundamental path corresponding to the groove, a force is applied resisting the device’s movement, as is described above. Additionally, Rosenberg

discloses that a force may be applied to the interface device in response to the position of the cursor along the groove (for example, see column 60, lines 2-23), and in response to the interaction of the cursor with the application (for example, column 60, lines 24-62). The magnitude of the force applied to the interface device is thus partially dependent on the position of the cursor along the groove, i.e. object fundamental path, and partially dependent on the interaction of the cursor with the application.

Concerning claims 23 and 24, Rosenberg discloses that the magnitude of the force resisting the interface device's motion off of the device fundamental path is partially dependent on a parameter of the interface, namely a "magnitude parameter" (for example, see column 38, lines 38-53). As a major goal of such force feedback is to assist the user in targeting graphical user interface objects (see column 44, lines 50-64), this magnitude parameter is considered a "user-assistance parameter," like recited in claim 23. Additionally, Rosenberg discloses that the user may adjust such parameters to suit his or her needs (for example, see column 52, lines 54-59). The magnitude parameter may thus be established by a measure of the user's proficiency in manipulating the interface device.

In reference to claim 25, Rosenberg teaches defining a motion-initiation region, namely a "force field," which comprises a portion of the interface device range of motion (see column 40, lines 21-41). In response to determining that the input device is within this force field, an "attractive" force may be applied to the device urging it to a device fundamental path corresponding to a groove (see column 59, lines 49-63).

With respect to claim 26, Rosenberg discloses that a groove force may be an internal force, meaning that it is established once the user positions a cursor within a region associated

with the groove (see column 3, lines 37-49; and see column 59, line 49 – column 60, line 13).

Rosenberg thus teaches determining when the user establishes a motion-initiation signal, specifically by determining when the user positions a cursor within a region associated with a groove. In response, an object fundamental path i.e. a groove, is established. As this groove is associated with a corresponding device fundamental path, it is understood that a device fundamental path is additionally established according to a defined path, namely this groove, and a position of the cursor when the motion-initiation signal was supplied.

Concerning claims 27 and 30, Rosenberg teaches determining when the user establishes a motion-initiation signal, specifically by determining when the user positions a cursor within a region associated with a groove, as is described in the previous paragraph. The motion-initiation signal thus comprises motion of the cursor to a defined range of the cursor's motion, or in other words, motion of the input device having defined characteristics.

Concerning claims 28 and 29, Rosenberg discloses that a "command gesture," which may involve a switch actuated by the user, may be applied to modify forces within a certain region of the GUI (see column 45, line 61 – column 46, line 12). For example, Rosenberg teaches that a user may position the cursor within a particular region and actuate a button on the interface device in order to remove forces applied in the region (see column 45, line 61 – column 46, line 12). It is therefore understood that, by analogy, forces may be established in a particular region by positioning the cursor in the region and actuating the button. Thus with the above-described situation wherein a groove force is established in response to a motion-initiation signal, particularly the user moving a cursor within a region associated with the groove, the groove force may also be established by additionally actuating a button on the user interface device. As this

groove is associated with a corresponding device fundamental path, it is understood that a device fundamental path is additionally established according to a defined path, namely this groove, and a position of the cursor when the motion-initiation signal was supplied. Thus, Rosenberg teaches a motion-initiation signal that comprises a switch actuated by the user, and the detection of the position of the cursor in a defined range of the cursor's range of motion, in order to determine if it is within a particular region of the GUI.

Regarding claim 33, Rosenberg discloses that the above-described method may be implemented within a human/computer interface (for example, see column 2, line 53 – column 3, line 17). Such a human/computer interface implementing the above-described method is considered a “human-computer interface,” like described in claim 33.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 5,655,093, which is attributed to Frid-Nielson. As shown above, Rosenberg teaches a method like that recited in claim 1, wherein particularly, an object fundamental path, namely a groove, is established to represent a path of motion of an object in a computer application, and a corresponding device

fundamental path is established to represent a path an interface device must take in order to move the object along the object device fundamental path. This object may be, for instance, a cursor displayed within a graphical user interface, and the object fundamental path may be defined by a groove applied to a scroll bar, such that the user is freely able to move the cursor along the length of the scroll bar, but movement out of the scroll bar is resisted (see column 59, line 49 – column 50, line 39). As the device fundamental path represents a path the interface device must take in order to move the cursor along the groove – the scroll bar in this case – it is understood that when the device is not on the device fundamental path, the cursor is not within the bounds of the scroll bar. Rosenberg, however, does not explicitly disclose that the cursor on the scroll bar is perceptively different from the cursor off the scroll bar, or in other words, that the cursor when the device is on the device fundamental path is perceptively different from the cursor when the device is not on the device fundamental path, as is expressed in claim 9.

Like Rosenberg, which teaches providing force feedback in response to graphical objects encountered by the cursor, Frid-Nielsen teaches providing feedback to the user in response to graphical objects encountered by the cursor. Frid-Nielsen particularly teaches adjusting the depiction of the cursor to provide information about which user inputs are available on the objects encountered by the cursor. For example, and regarding the claimed invention, Frid-Nielsen discloses that the appearance of the cursor may be altered when it is placed on a scroll bar, the altered appearance indicating valid inputs of the user interface device (See column 8, lines 29-48).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Frid-Nielsen before him at the time the invention was made, to

modify the cursor of Frid-Nielsen, such that it changes its appearance when placed on a scroll bar, or in other words, such that the cursor when the device is on the device fundamental path is perceptively different from the cursor when the device is not on the device fundamental path. It would have been advantageous to one of ordinary skill to utilize such a combination because such a modifiable cursor image provides information about system commands to the user, thus creating a more intuitive user interface, as is taught by Frid-Nielsen (see column 3, lines 31-39).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 6,191,785, which is attributed to Bertram et al. (and hereafter referred to as “Bertram”). As described above, Rosenberg teaches a method like that described in claim 1, and whereby the method may particularly be applied to a scroll bar to comprise: establishing an object fundamental path, i.e. a groove, representing the path of motion of a scroll bar “thumb;” establishing a device fundamental path in correspondence with the groove; detecting motion of an interface device; moving the thumb in the computer application along the groove responsive to a component of interface device motion along the device fundamental path; and applying a force to the input device responsive to a component of interface device motion not along the device fundamental path. Rosenberg, however, does not explicitly disclose that additional object fundamental paths may be established, as is expressed in claim 10.

Like Rosenberg, Bertram discusses scroll bars (for example, see column 1, line 19 – column 2, line 13). Regarding the claimed invention, Bertram teaches that a graphical user

interface may comprise a plurality of scroll bars, each having a thumb (for example, see the scroll bars represented by reference numbers 64 and 70 in figure 3).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Bertram before him at the time the invention was made, to modify the interface by Rosenberg to include a plurality of scroll bars, as done by Bertram. It would have been advantageous to one of ordinary skill to utilize such a combination because a plurality of scroll bars allow the user to scroll the display in more than one dimension, such as for example, they allow the user to scroll both horizontally and vertically, as is demonstrated by Bertram. Thus with the method of Rosenberg applied to a plurality of scroll bars, each scroll bar having a "groove" associated therewith, a second object fundamental path, i.e. groove, representing the path of motion of a second thumb is established; a second device fundamental path in correspondence with the second groove is established; it is determined if either fundamental path is active, or in other words, if the user has selected one of the thumbs using a cursor; the selected thumb is moved along its associated groove responsive to a component of interface device motion along the active device fundamental path; and a force is applied to the interface device responsive to a component of interface device motion not along the active device fundamental path.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 6,583,782, which is attributed to Gould et al. (and hereafter referred to as "Gould"). As shown above, Rosenberg teaches a method like that recited in claim 1, wherein particularly, an object fundamental path,

namely a groove, is established to represent a path of motion of an object in a computer application, and a corresponding device fundamental path is established to represent a path an interface device must take in order to move the object along the object device fundamental path. This object may be, for instance, a cursor displayed within a graphical user interface. Rosenberg, however, does not explicitly disclose that the device fundamental path has a different shape than the object fundamental path, as is recited in claim 15.

Like Rosenberg, wherein force feedback is provided to the interface device in response to graphical objects encountered by the cursor, Gould teaches providing “virtual force feedback” to the user in response to graphical objects encountered by the cursor (for example, see column 6, lines 42-62). Such virtual force feedback is applied by affecting the movement of the cursor, relative to the movement of the interface device (see column 8, lines 31-42). For example, Gould discloses that such virtual force feedback can be applied to a thumb or an elliptical selector wheel displayed within a graphical user interface (See column 16, lines 5-24). Virtual force feedback, similar to the groove force described by Rosenberg, may be applied to keep the cursor on the wheel. However in the case of virtual force feedback, the user does not have to move the input device in the exact circular shape of the wheel in order to keep the cursor on the wheel – the cursor is maintained on the wheel in response to attractive and repelling virtual forces provided by the wheel. Thus regarding the claimed invention, Gould teaches that the path in which the cursor moves on the screen, i.e. the object fundamental path, may have a different shape than the path in which the interface device moves, i.e. the device fundamental path (for example, see figure 10A, and its corresponding description in column 16, lines 48-60).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Gould before him at the time the invention was made, to modify the graphical user interface taught by Rosenberg to include virtual force feedback, or in other words, such that the device fundamental path does not have to be the same shape as the object fundamental path, as is taught by Gould. It would have been advantageous to one of ordinary skill to utilize such a combination because such virtual force feedback reduces “background mechanical noise” as is taught by Gould (see column 6, line 63 – column 7, line 3). Background mechanical noise may reduce productivity, even with force feedback devices like that of Rosenberg (see column 2, lines 4-9; and column 1, lines 31-41 of Gould).

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rosenberg, which is described above, and also over U.S. Patent No. 6,552,722, which is attributed to Shih et al. (and hereafter referred to as “Shih”). As described above, Rosenberg teaches a method like that described in claim 1, whereby a device fundamental path is established, in correspondence with a defined “groove,” to represent a path of movement of an interface device. While Rosenberg discloses that the groove, and consequently the corresponding device fundamental path, may be defined along a given degree of freedom of the interface device (see, for example, column 32, lines 44-55; and column 38, lines 38-51), Rosenberg does not explicitly disclose that the device fundamental path defines a curve in three-dimensions, a curve in two-dimensions, or a surface in three-dimensions, as is recited in claims 16-18, respectively.

Like Rosenberg, Shih teaches establishing an object fundamental path, which is defined by a “geometric constraint,” and which represents a path of motion of a “virtual tool” object in a user interface (see the abstract of Shih). As a haptic interface device is used to affect the motion of the virtual tool in the interface (see the abstract of Shih), a corresponding device fundamental path representing the path of motion required by the interface device to move the virtual tool along the object fundamental path is considered to be likewise established. As also done by Rosenberg, a force is applied to the interface device of Shih responsive to a component of input device motion not along this device fundamental path (for example, see column 37, line 41 – column 38, line 11). Regarding the claimed invention, Shih teaches that the object fundamental path, and consequently its corresponding device fundamental path, as defined by a geometric constraint, may define a point, line, curve, surface, or space representation, understood to be within two- or three- dimensions (for example, see column 37, lines 15-40; and column 8, line 21 – column 8, line 23).

It would have therefore been obvious to one of ordinary skill in the art, having the teachings of Rosenberg and Shih before him at the time the invention was made, to modify the device fundamental path taught by Rosenberg such that it defines a curve in three-dimensions, defines a curve in two-dimensions, or defines a surface in three-dimensions, as is done by Shih. It would have been advantageous to one of ordinary skill to utilize such a combination because such device fundamental paths are applicable in a plurality of applications, specifically CAD applications, as is taught by Shih (for example, see column 1, line 61 – column 2, line 9). Modifying Rosenberg by Shih would thus create a more general, and more useful, technique for providing feedback.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,220,963, which is attributed to Meredith, and also over the U.S. Patent of Rosenberg, which is described above. In general, Meredith describes a computerized pool cue input device for use with computer-simulated games of pool (see column 2, lines 6-13). The movement of this input device results in corresponding movement of a displayed object, namely the tip of a cue stick, on a computer display (see column 5, lines 16-30). Thus regarding claim 32, Meredith discloses: a computer application which comprises a pool simulation; an object in the in the computer application, wherein the object comprises a pool cue; an object fundamental path representing a path of motion in the computer application, wherein the object fundamental path comprises a path suited for perception of the motion of a pool cue. In response to detecting the motion of the input device, i.e. computerized pool cue, the object in the application is moved along the object fundamental path responsive to a component of input device motion along the device fundamental path. Meredith, however, does not explicitly teach establishing an object fundamental path and a device fundamental path, such that a force is applied to the input device responsive to a component of input device motion not along the device fundamental path, as is recited in claim 1, upon which claim 32 depends.

As described above, Rosenberg teaches establishing an object fundamental path, namely a groove, and a corresponding device fundamental path, such that an object in an application is moved along the object fundamental path responsive to a component of input device motion along the device fundamental path, and such that a force is applied to the input device responsive to a component of input device motion not along the device fundamental path. Moreover,

Rosenberg teaches that such a force may be applied to a computerized pool cue input device (for example, see column 13, line 65 – column 14, line 9).

Consequently, it would have been obvious to one of ordinary skill in the art, having the teachings of Meredith and Rosenberg before him at the time the invention was made, to modify the input device and simulation taught by Meredith such that force feedback is applied to the input device response to input device motion not along an established device fundamental path, as is done by Rosenberg. It would have been advantageous to one of ordinary skill to utilize such a combination because such force feedback can reduce the difficulty of required “targeting” tasks, thus facilitating interaction with the computer application, particularly for users having dexterity-debilitating conditions, as is taught by Rosenberg (for example, see column 44, lines 50-64).

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,277,030, which is attributed to Baynton et al. (and hereafter referred to as “Baynton”), and also over the combination of Rosenberg and Meredith, which is described above. In general, Baynton describes a computerized golf swing apparatus, which provides force feedback to correct a user’s golf swing (for example, see the abstract). Baynton more specifically teaches: establishing a device fundamental path, namely a predetermined golf swing path; detecting motion of an input device; and applying force to the input device responsive to a component of the input device motion not along the device fundamental path (see column 3, lines 17-52). However, Baynton does not explicitly teach implementing such a golf swing apparatus as an input to an application comprising a golf simulation, as is expressed in claim 31. Baynton therefore does not teach:

establishing an object fundamental path representing a path of motion of an object in the computer application, wherein the object comprises a golf club, wherein the object fundamental path comprises a path suited for perception of the swing of the golf club, and wherein the object moves along the object fundamental path responsive to a component of input device motion along the device fundamental path, as is expressed in claims 1 and dependent claim 31.

Similar to Baynton, Rosenberg and Meredith teach implementing an input apparatus, which comprises a pool cue, and which provides for feedback to the user. Rosenberg and Meredith particularly teach implementing such an apparatus as an input to an application comprising a pool simulation by: establishing an object fundamental path representing a path of motion of an object in the computer application, wherein the object comprises a pool cue, wherein the object fundamental path comprises a path suited for perception of the motion of the pool cue, and wherein the object moves along the object fundamental path responsive to a component of input device motion along the device fundamental path.

It would have been obvious to one of ordinary skill in the art, having the teachings of Baynton, Meredith, and Rosenberg before him at the time the invention was made, to modify the input device taught by Baynton such that it is implemented in a golf simulation, analogous to the pool simulation of Meredith and Rosenberg. In other words, it would have been obvious to modify the golf swing apparatus of Baynton such that it serves as an input to an application comprising a golf simulation, specifically by: establishing an object fundamental path representing a path of motion of an object in the computer application, wherein the object comprises a golf club, wherein the object fundamental path comprises a path suited for perception of the motion of the golf club, and wherein the object moves along the object

fundamental path responsive to a component of input device motion along the device fundamental path. It would have been advantageous to one of ordinary skill to utilize this combination, because using the apparatus as an input to such a simulation would allow the user to view the results of his or her swing, as is demonstrated by Meredith. Thus, in addition to providing entertainment value, the simulation would allow the user to better improve his or her swing.

Conclusion

The prior art made of record on form PTO-892 and not relied upon is considered pertinent to applicant's disclosure. The applicant is required under 37 C.F.R. §1.111(C) to consider these references fully when responding to this action. The Hidaka et al. U.S. Patent cited therein teaches: establishing an object fundamental path, establishing a device fundamental path, and moving the object along the object fundamental path in correspondence to input device motion along the device fundamental path, wherein the device fundamental path has a different shape than the object fundamental path. The "gamerom2000" reference cited therein presents a pool simulation, similar to that expressed in claim 32.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blaine Basom whose telephone number is (703) 305-7694 prior to 10/20/2004, and (571) 272-4044 after 10/20/2004. The examiner can normally be reached on Monday through Friday, from 8:30 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cabeca can be reached on (703) 308-3116 prior to 10/20/2004, and (571) 272-4048 after 10/20/2004. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

btb



RAYMOND J. BAYERL
PRIMARY EXAMINER
ART UNIT 2173